Public Abstract
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With high prices for fuel and airfare, companies are looking to minimize operational costs. Reducing aircraft fuel consumption is one strategy companies use to lower costs. During flights, commercial aircraft divide the cruise portion's range into cruise-steps, which are changes in altitude typically in increments of 2,000 ft. These cruise-steps allow the aircraft to ascend in a manner easily tracked by Air Traffic Control. This study focuses on the cruise portion of a commercial aircraft's flight. The number and size of the cruise-steps are free. The amount of cruise-steps corresponds to the number of segments comprising the cruise range. The free variables are the velocity and altitude profiles, and the throttle setting for the step-climbs. Optimized results are compared with the analytical range equations and an actual flight. An upper atmospheric wind model is incorporated into this scenario to determine the effects of jet streams. The main objective of this study is to show an optimized flight trajectory by minimizing fuel costs thereby reducing financial costs of flying.